

REMARKS

Applicant has carefully reviewed the Office Action mailed February 3, 2009 and offers the following remarks.

The Examiner has noted that claims 1-5 include the term “adapted to” and states that this language suggests or makes optional the limitations following the claim language, and suggests that the claims be revised such that the steps/functions following the “adapted to” language to be performed are required and not optional (Office Action mailed February 3, 2009, p. 2). Applicant initially notes that the “adapted to” language by itself cannot be objectionable. A search of the U.S. Patent Office database indicates that over 514,000 patents have been issued with the term “adapted to” in the claims. Applicant therefore respectfully maintains that the “adapted to” language is proper.

Moreover, Applicant respectfully submits that in the present case, the limitations following the term “adapted to” are positive limitations. Contrary to the Patent Office’s assertion, the Federal Circuit has mandated that “adapted to” language is a positive limitation and must be considered when weighing patentability. *Pac-Tec, Inc. v. Amerace Corp.*, 903 F.2d 796, 801 (Fed. Cir. 1990) (citing *In re Venezia*, 530 F.2d 956 (CCPA 1976)). Moreover, functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210 (CCPA 1971). A functional limitation must be evaluated and considered, just like any other limitation in the claim, for what it fairly conveys to a person of ordinary skill in the art. M.P.E.P. § 2173.05(g). A functional limitation is often used in association with an element or step of a process or method to define a particular capability or purpose that is served by the recited element or step. *Ibid.* The determination of whether an “adapted to” clause is a limitation in a claim depends on the specific facts of the case. M.P.E.P. § 2111.04. When such a clause states a condition that is material to patentability, it cannot be ignored in order to change the substance of the invention. *Ibid.*; see *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 U.S.P.Q.2d (BNA) 1481, 1483 (Fed. Cir. 2005).

In claims 1-5, the term “adapted to” sets definite boundaries on the scope of the patent protection. Claim 1 recites an adaptive interconnect for providing an interface between multiple modules and a control system comprising a control system interface, a plurality of module interfaces, and adaptive interconnect logic associated with the control system interface and the plurality of module interfaces and adapted to perform the claimed functions. The “adapted to”

clause in claim 1 thus clearly sets forth steps that are material to patentability; if ignored, it would change the substance of the invention. *See Hoffer v. Microsoft Corp.*, 405 F.3d at 1329, 74 U.S.P.Q.2d (BNA) at 1483 (Fed. Cir. 2005). Therefore, the “adapted to” clauses must be considered and the limitations given weight. As the objected to claim language is allowed by the Federal Circuit case law, claims 1-5 are proper and should be allowed.

Claims 7-12 and 17-20 were rejected under 35 U.S.C. § 101 as allegedly not falling within one of the four statutory categories of invention. Applicant respectfully traverses. Independent claim 7 is directed to a method for providing an interface between multiple modules and a control system. The method of claim 7 is tied to another statutory category such as a particular apparatus, and is thus proper under 35 U.S.C. § 101. In particular, claim 7 recites negotiating with a module over a control path via one of a plurality of module interfaces to identify an interface personality for the module. Thus, claim 7 is tied to a control path over which negotiations with a module take place. Moreover, claim 7 recites applying an interface personality to one of a plurality of module interfaces, such that the applied interface personality provides an appropriate interconnection between the control system and the one of the plurality of module interfaces via a plurality of pins. Thus, claim 7 provides an appropriate interconnection between the control system and the one of the plurality of module interfaces via a plurality of pins. The interconnection between a control system and a module interface is a particular apparatus, as evidenced by the fact that the interconnection is provided via a plurality of pins, which are tangible. Accordingly, claim 7 (as well as claims 8-12 and 17-20, which depend from claim 7) is tied to a particular apparatus, and thus is directed to proper statutory subject matter under 35 U.S.C. § 101. The rejection under 35 U.S.C. § 101 should therefore be withdrawn.

Claims 1-12, 16, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,043,569 B1 to Chou et al. (hereinafter “Chou”) in view of U.S. Patent No. 7,000,052 B2 to Moon et al. (hereinafter “Moon”). Applicant respectfully traverses the rejection. To establish *prima facie* obviousness, the Patent Office must show where each and every element of the claim is taught or suggested in the combination of references. M.P.E.P. § 2143.03. If the Patent Office cannot establish obviousness, the claims are allowable.

Applicant maintains its arguments from the previous responses that the combination of Chou and Moon does not teach or suggest adaptive interconnect logic adapted to: “i) negotiate

with a module over a control path via one of the plurality of module interfaces to identify an interface personality for the module; ii) select the interface personality based on negotiations with the module; and iii) apply the interface personality to the one of the plurality of module interfaces,” as recited in claim 1 (see Response filed July 15, 2008, pp. 3-7; Response filed October 17, 2008, pp. 3-7; and Response filed November 18, 2008, pp. 5-6). Neither Chou nor Moon teaches or suggests the claimed interface personality.

In addition, the combination of Chou and Moon does not teach or suggest that the interface personality that is applied to the one of the plurality of module interfaces provides an appropriate interconnection between the control system interface and the one of the plurality of module interfaces via a plurality of pins, as recited in claims 1 and 7. Neither Chou nor Moon mentions that an appropriate interconnection is provided by the interface personality between the control system interface and the one of the plurality of module interfaces via a plurality of pins.

The Patent Office alleges that Figures 2, 5, and 6, and column 8, lines 20-50 of Chou teach that the applied interface personality provides an appropriate interconnection between the control system interface and the one of the plurality of module interfaces via a plurality of pins (Office Action mailed February 3, 2009, pp. 4-5). Applicant respectfully disagrees. In Chou, the values of one or more input pins of the interconnect device are used to identify the storage device which stores the configuration data (Chou, col. 8, lines 30-32). Thus, Chou teaches using the value of the input pins to get the configuration data. The configuration data in Chou is not obtained until the input pins are used to identify the storage device which has the configuration data. Therefore, the configuration data in Chou, which is equated by the Patent Office to the claimed interface personality, is not applied to provide an appropriate interconnection between the control system interface and the one of the plurality of module interfaces via a plurality of pins. The pins in Chou are used to get the configuration data, not to provide the interconnection between the control system interface and the one of the plurality of module interfaces. Accordingly, Chou does not teach or suggest adaptive interconnect logic adapted to “apply the interface personality to the one of the plurality of module interfaces, **such that the applied interface personality provides an appropriate interconnection between the control system interface and the one of the plurality of module interfaces via a plurality of pins,**” as recited in claim 1.

The configuration data in Chou is not applied to provide an appropriate interconnection between the control system interface and the one of the plurality of module interfaces via a plurality of pins. Moon does not cure the deficiencies of Chou in this regard. The configuration parameter in Moon merely discloses a configuration parameter which is used to identify an aspect of the input/output card to the end user (Moon, col. 1, lines 50-55). The configuration parameter of Moon simply does not establish an interconnection of any sort between the claimed control system and the claimed module interface, much less provide an appropriate interconnection between the control system interface and the one of the plurality of module interfaces via a plurality of pins. Thus, the combination of Chou and Moon does not teach each and every element of independent claims 1 and 7 as amended. Claims 1 and 7 are therefore patentable.

Claims 2-6 and 8-12 depend from claims 1 and 7, respectively, and contain all of the limitations of the independent claim from which they depend. Thus, claims 2-6 and 8-12 are patentable based on their dependency from claims 1 and 7.

In addition, certain dependent claims require special mention as they contain additional limitations not taught by the combination of Chou and Moon. Claims 2 and 8 recite the additional limitation of “wherein different interface personalities can be implemented simultaneously among the plurality of module interfaces.” The Patent Office alleges this limitation is taught by Chou in column 4, lines 20-25 and lines 42-46, and column 6, lines 20-28, which the Patent Office asserts discloses “providing the configuration data to units of the switch” (Office Action mailed February 3, 2009, p. 5). Applicant respectfully disagrees. Chou discloses that a configuration module provides configuration data to various components of the switch (Chou, col. 4, lines 20-24 and lines 42-46; and col. 6, lines 20-28). However, the cited portions of Chou do not teach or suggest that **different** interface personalities are implemented **simultaneously** among the plurality of modules, as recited in claims 2 and 8. There is no mention in the cited portions of Chou that the configuration data provided to various components of the switch is different, and there is no mention that the configuration data is implemented simultaneously. Thus, the cited portions of Chou do not teach this additional limitation of claims 2 and 8. Accordingly, claims 2 and 8 are also patentable for this additional reason.

Claim 5 recites the additional limitation that the adaptive interconnect logic is further adapted to:

- a) receive a stimulus indicative of a change in personality for the module;
 - b) renegotiate with the module over the control path via one of the plurality of module interfaces to identify a new interface personality for the module;
 - c) select the new interface personality based on the renegotiations with the module;
- and
- d) apply the new interface personality to the one of the plurality of module interfaces.

Claim 11 contains similar limitations. Thus, claims 5 and 11 recite that the claimed adaptive interconnect logic is further adapted to renegotiate, select, and apply a new interface personality for the module when it receives a stimulus indicative of a change in personality for the module.

The Patent Office asserts that Chou teaches the limitations of claims 5 and 11 (Office Action mailed February 3, 2009, pp. 5 and 7). Applicant respectfully disagrees. Chou does not teach where the adaptive interconnect logic is further adapted to “receive a stimulus indicative of a change in personality for the module,” as recited in claims 5 and 11. Chou does disclose an initialization module that takes control when a reset is asserted (Chou, col. 5, lines 49-50). The initialization module queries the processor subsystem interface for configuration data until receiving an indicator associated with the end of the configuration data (Chou, col. 5, lines 57-60). Thus, the indicator in Chou is an indicator of the end of the configuration data, *i.e.*, that all of the configuration data has been received, and is not indicative of a **change in personality for the module**, as recited in claims 5 and 11. At best, Chou discusses a change in status of the communication ports or the switch (Chou, col. 5, lines 57-62). There is no teaching or suggestion of a change in the **interface personality** for the module in the cited portion of Chou. Accordingly, Chou does not teach or suggest where the adaptive interconnect logic is further adapted to “receive a stimulus indicative of a change in personality for the module,” as recited in claims 5 and 11. Claims 5 and 11 are therefore patentable for this additional reason.

Moon does not cure the deficiencies of Chou with respect to claims 5 and 11. Moon simply discloses that a configuration parameter may be selected for an input/output card (Moon, col. 1, lines 50-55). Moon does not disclose or suggest adaptive interconnect logic that is further adapted to “receive a stimulus indicative of a change in personality for the module,” as recited in claims 5 and 11. In addition, Moon does not teach or suggest renegotiating with the module to

identify and select a new interface personality to be applied for the module, as recited in claims 5 and 11. As such, Applicant requests that the rejection of claims 5 and 11 be withdrawn.

In addition, claims 16 and 20 recite the additional limitation that the interface personality further defines an acceptable protocol for communications with the module. The Patent Office states that column 2, lines 42-63 of Moon teaches this limitation (Office Action mailed February 3, 2009, p. 8). Applicant respectfully disagrees. The cited portion of Moon merely mentions that the communication system of Moon may be implemented in conjunction with a PC104 or a PC104+ protocol, or in conjunction with any other suitable protocol according to particular needs. Moon does not disclose that the acceptable protocol for communications with the module is defined by the interface personality of the claimed invention, as recited in claims 16 and 20. Claims 16 and 20 are thus patentable for this additional reason.

Claims 13, 14, 17, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou in view of Moon and further in view of U.S. Patent No. 5,689,714 to Moyer (hereinafter “Moyer”). Applicant respectfully traverses. The standards for obviousness are set forth above.

Claims 13 and 14 depend from claim 1 and contain all of the limitations of the claim 1. Claims 17 and 18 depend from claim 7 and contain all of the limitations of claim 7. As set forth above, the combination of Chou and Moon does not teach or suggest each and every limitation of claims 1 and 7. Moyer does not cure the deficiencies of Chou and Moon in this regard. Thus, claims 13, 14, 17, and 18 are patentable based on their dependency from claims 1 and 7.

Moreover, claims 13 and 17 recite that the plurality of pins that provide the appropriate interconnection between the control system interface and the one of the plurality of module interfaces include power pins, control pins, and datapath pins. Claims 14 and 18 recite the further limitation that the adaptive interconnect logic negotiates with the module using the control pins. The combination of Chou, Moon, and Moyer does not teach or suggest these limitations.

The Patent Office alleges that Figures 5 and 6 and column 8, lines 30-50 of Chou teach the claimed datapath pins (Office Action mailed February 3, 2009, p. 9). Applicant respectfully disagrees. Chou merely discloses input pins. First, there is no indication that the input pins in Chou are datapath pins. Second, as discussed above, the input pins in Chou do not provide an interconnection between the control system interface and the one of the plurality of module

interfaces. Thus, Chou, alone or in combination with Moon and Moyer, does not teach or suggest that the plurality of pins that provide the appropriate interconnection between the control system interface and the one of the plurality of module interfaces include power pins, control pins, and datapath pins.

The Patent Office alleges that column 5, lines 32-37 and column 7, lines 45-56 of Moon teach the claimed power pins (Office Action mailed February 3, 2009, p. 9). Applicant respectfully disagrees. Column 5, lines 32-37 of Moon discloses identification pins and output pins, but not power pins. Column 7, lines 45-56 of Moon discusses a power up of a PC104+ stack, which may involve a master that controls a reset pin. The reset pin of Moon is not equivalent to the claimed power pins. Moreover, the pins disclosed in Moon are not part of an interconnection between the control system interface and the one of the plurality of module interfaces as provided by the applied interface personality, as recited in the claimed invention. Thus, Moon, alone or in combination with Chou and Moyer, does not teach or suggest that the plurality of pins that provide the appropriate interconnection between the control system interface and the one of the plurality of module interfaces include power pins, control pins, and datapath pins.

The Patent Office alleges that Figures 1 and 2, column 2, lines 40-55, and column 4, lines 1-25 of Moyer teach the claimed control pins (Office Action mailed February 3, 2009, p. 9). While Moyer does disclose control pins, Moyer does not teach or suggest that the control pins are part of an interconnection between the control system interface and the one of the plurality of module interfaces as provided by the applied interface personality, as recited in the claimed invention. In addition, Moyer fails to disclose that the control pins are used by the adaptive interconnect logic in its negotiations with the module. Moyer simply mentions that control information is communicated to the control pins by a bus controller (Moyer, col. 2, lines 38-41). There is no mention of the control pins in Moyer being used to negotiate with a module. Thus, Moyer, alone or in combination with Chou and Moon, fails to teach or suggest that the plurality of pins that provide the appropriate interconnection between the control system interface and the one of the plurality of module interfaces include power pins, control pins, and datapath pins, as recited in claims 13 and 17. Moreover, Moyer, alone or in combination with Chou and Moon, does not teach or suggest that the adaptive interconnect logic negotiates with the module using

the control pins, as recited in claims 14 and 18. Claims 13, 14, 17, and 18 are therefore patentable over the cited references.

Claims 15 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chou in view of Moon and further in view of U.S. Patent No. 6,392,891 B1 to Tzlil et al. (hereinafter “Tzlil”). Applicant respectfully traverses. The standards for obviousness are set forth above.

Claim 15 depends from claim 1 and contains all of the limitations of the claim 1. Claim 19 depends from claim 7 and contains all of the limitations of claim 7. As set forth above, the combination of Chou and Moon does not teach or suggest each and every limitation of claims 1 and 7. Tzlil does not cure the deficiencies of Chou and Moon in this regard. Thus, claims 15 and 19 are patentable based on their dependency from claims 1 and 7.

In addition, claims 15 and 19 recite the additional limitation that the interface personality further defines signal levels for communications with the module. The Patent Office states that column 1, lines 23-35 of Tzlil teaches this limitation (Office Action mailed February 3, 2009, p. 11). Applicant respectfully disagrees. The cited portion of Tzlil merely mentions that various standards involving the properties of circuit card modules include specifications as to signal functions and signal voltage levels. Tzlil does not mention that the signal levels are defined by an interface personality of the type in the claimed invention, as recited in claims 15 and 19. Claims 15 and 19 are thus patentable for this additional reason.

The present application is now in condition for allowance and such action is respectfully requested. The Examiner is encouraged to contact Applicant’s representative regarding any remaining issues in an effort to expedite allowance and issuance of the present application.

Respectfully submitted,

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Date: June 3, 2009

Attorney Docket: 7000-248